

CLAIMS

1. A combination hearing protector/communication system assembly that attenuates undesired external sounds and delivers audio to the user,
5 comprising:

a first hearing protecting muff for attenuating sounds and receiving desired acoustic signals, the muff enclosing an optical transmitter for transmitting optical signals representative of the received acoustic signals; and

10 an ear-plug assembly including an optical receiver for receiving the transmitted optical signals and a transducer for providing acoustic signals representative of the acoustic signals received by the muff.

2. The assembly of claim 1, wherein the optical transmitter includes one or more light emitting diodes (LEDs).
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3. The assembly of claim 2, wherein the muff receives modulated acoustic signals from a remote modulator and provides the signals to the LEDs.

20 4. The assembly of claim 2, wherein the muff incorporates a modulator for providing modulated acoustic signals to the LEDs.

5. The assembly of claim 1, wherein the optical receiver includes a photovoltaic cell.

25 6. The assembly of claim 5, wherein the ear-plug assembly includes a demodulator and a transducer, the photovoltaic cell providing signals to the demodulator, which provides demodulated signals to the transducer.

7. The assembly of claim 1, further comprising a second muff and a second ear-plug, each substantially the same as the first.

5 8. The assembly of claim 7, wherein the first and second muffs receive and provide signals over separate channels.

9. The assembly of claim 8, wherein each muff has separate modulator and buffer circuits.

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10. The assembly of claim 9, wherein the circuits for the muffs share use of an oscillator.

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11. A method for providing hearing protection and desired audio signals, comprising:

- a hearing protecting muff receiving an audio signal;
- converting the audio signal to a light signal;
- transmitting the light signal from the muff to the ear-plug;
- an ear-plug with a detector receiving the light signals;
- 20 converting the optical signal to an acoustic signal.

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12. The method of claim 11, wherein the transmitting includes transmitting one of visible or infrared light.

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13. The method of claim 11, wherein the converting processes include pulse width modulation and demodulation.

14. The method of claim 11, further comprising receiving an audio signal with a second muff, and transmitting a light signal to a second ear-plug over a separate channel.

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15. A hearing protection system including a muff and an ear-plug, with optical communication therebetween.